

Aim:

Write a java program to sort the given list of elements using **Merge Sort**.

Source Code:

q36416/MergeSort.java

```
package q36416;
import java.io.*;
import java.util.Scanner;
class MergeSort
{
    public static void main(String args[])
    {
        int n;
        System.out.print("Enter no of elements: ");
        Scanner s = new Scanner(System.in);
        n=s.nextInt();
        int a[]=new int [n];
        System.out.println("Enter the elements:");
        for(int i=0;i<n;i++)
        {
            a[i] = s.nextInt();
        }
        MergeSort x= new MergeSort();
        MergeSort.mergesort(a,0,n-1);
        System.out.println("Sorted array: ");
        for(int i=0;i<n;i++)
        {
            System.out.print(a[i]+" ");
        }
    }
    public static void mergesort(int a[],int low,int high)
    {
        if(low<high)
        {
            int mid = (low+high)/2;
            mergesort(a,low,mid);
            mergesort(a,mid+1,high);
            merge(a,low,mid,high);
        }
    }
    public static void merge(int a[],int low,int mid,int high)
    {
        int i=low,temp,j=mid+1,k=low;
        int b[]=new int[20];
        while(i<=mid && j<=high)
        {
            if(a[i] < a[j])
            {
                b[k]=a[i];
                i++;
            }
        }
    }
}
```

```

        else
        {
            b[k]=a[j];
            j++;
        }
        k++;
    }
    if(i>mid)
    {
        while(j<=high)
        {
            b[k]=a[j];
            k++;
            j++;
        }
    }
    else
    {
        while(i<=mid)
        {
            b[k]=a[i];
            i++;
            k++;
        }
    }
    i=0;
    for(i=low;i<=high;i++)
    a[i]=b[i];
}
}

```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter no of elements: 3
Enter the elements: 100 50 75
Sorted array:
50 75 100

Test Case - 2
User Output
Enter no of elements: 4
Enter the elements: 1 3 5 2
Sorted array:
1 2 3 5